REMARKS

Applicant appreciates the detailed examination evidenced by the Office Action. Claims 1, 4-11, and 13-14 have been amended, Claims 12 and 15 have been newly canceled, and Claims 29-32 have been added. No new matter has been introduced by these amendments. Applicant respectfully submits that the pending claims are patentable over the cited references for at least the reasons that are explained below.

Claims 1-11 and 12-14 are Patentable Over Qi in view of Schwarz

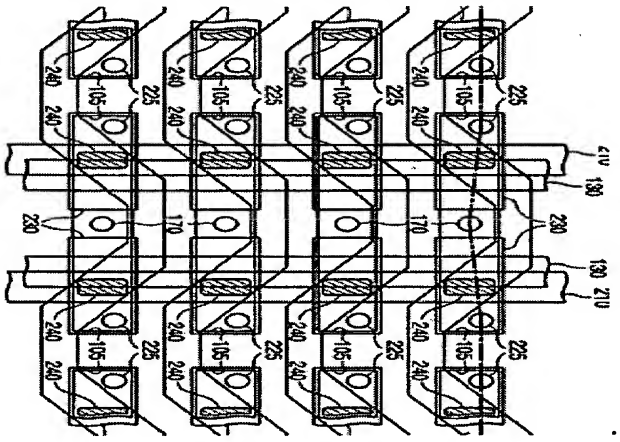
Claims 1-11 and 13-14 stand rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 6,697,294 to Qi et al. (hereinafter "Qi") in view of U.S. Patent No. 6,891,193 to Schwarz (hereinafter "Schwarz").

Claim 1 has been amended to emphasize that the digit lines and the bit lines intersect each other at an oblique angle, and that digit lines and/or the bit lines each have a zigzag shape that reverses direction with respect to itself. Claim 1 now recites (emphasis added):

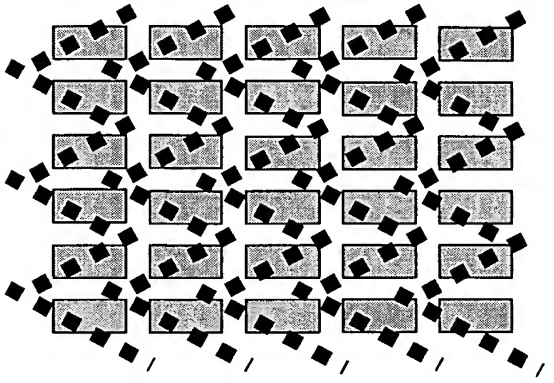
> 1. (Currently Amended) A magnetic memory comprising:
> a plurality of digit lines;
> a plurality of bit lines; and
> a plurality of magnetic tunnel junctions (MTJs) arranged in rows and columns at overlap points between the bit lines and the digit lines,
> wherein each of bit lines is coupled to MTJs in a respective column and each of the digit lines is coupled to MTJs in a respective row, and
> wherein the digit lines and the bit lines intersect each other at an oblique angle, and the digit lines and/or the bit lines each have a zigzag shape that reverses direction with respect to itself.

An exemplary embodiment of Claim 1 is shown in FIG. 9A of the present application, shown below. Digit lines 210 intersect the bit lines 260 at an oblique angle, and the digit lines 210 each have a zigzag shape that reverses direction with respect to itself (i.e., along a horizontal axis in FIG. 9A below). Accordingly, as shown below in FIG. 9A, as the digit lines 210 extend upward they reverse direction between heading right and heading left.

FIG. 9A of Present Application



Zigzag Shape of Digit Lines

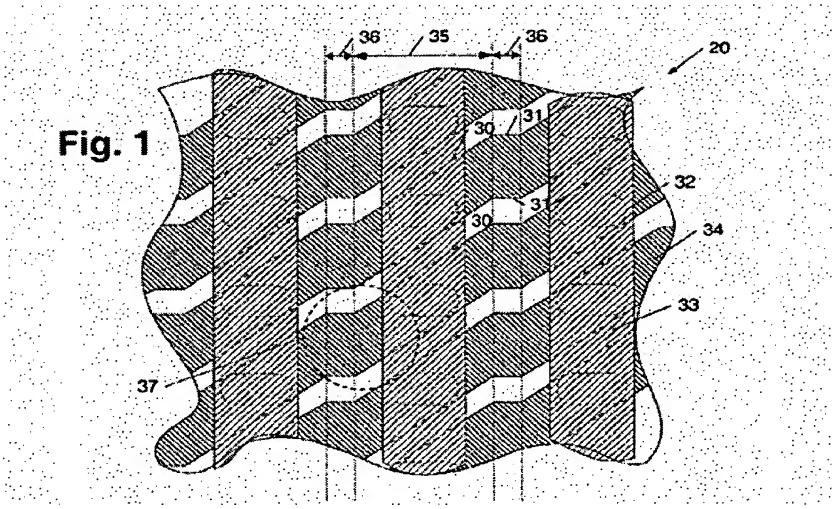


Another exemplary embodiment of Claim 1 is shown in FIG. 8A of the present application. The digit lines 210 intersect the bit lines 260 at an oblique angle, and the bit lines 260 each have a zigzag shape that reverses direction with respect to itself (i.e., reverse their extension along left and right directions as the lines extend upward).

The Office Action acknowledges that "Qi does not disclose a plurality of bit lines, wherein the digit lines and the bit lines intersect each other at an oblique angle." (Office Action, Page 3), but cites Schwarz to provide that recitation.

FIG. 1 of Schwarz shows digit lines 34 that continually extend upward and to the right to intersect bit lines 33.

FIG. 1 of Schwarz



Nowhere does Schwarz disclose that either the digit lines 34 or the bit lines 33 have a zigzag shape that reverses direction with respect to themselves. Accordingly, Applicant submits that Qi and Schwarz together do not disclose the recitation of Claim 1 that the digit lines and/or the bit lines each have a zigzag shape that reverses direction with respect to itself. For at least these reasons, Applicant submits that Claim 1 is patentable over Qi in view of Schwarz.

The dependent Claims 2-15 are patentable at least per the patentability of independent Claim 1 from which they depend. Moreover, these claims are submitted to be independently patentable over Qi in view of Schwarz.

For example, amended Claims 5-9 have each been amended to emphasize the interconnection of the zigzag shaped bit lines and/or digit lines with the MTJs. As explained above, neither Qi nor Schwarz disclose zigzag shaped bit lines or digit lines. Based on these further recitations Claims 5-9 are submitted to be patentable over Qi in view of Schwarz.

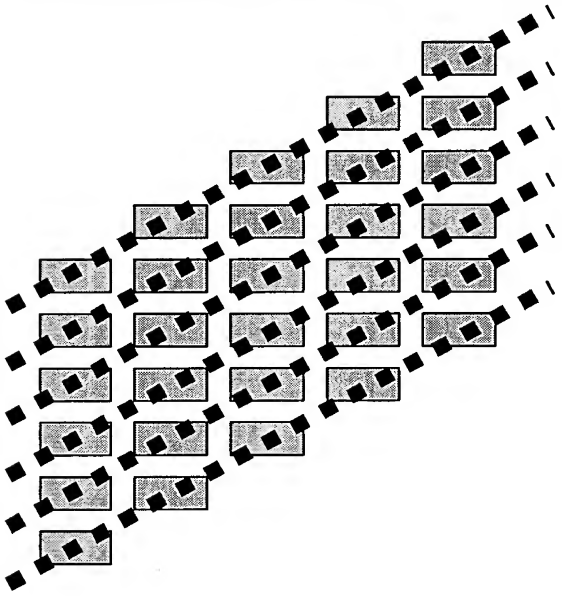
Amended Claims 10 and 13 recite that the MTJs have a parallelogram shape with two angles greater than approximately 90° and two angles less than approximately 90°. Exemplary embodiments of slanted parallelogram shaped MTJs are shown, for example, in FIG. 8B of the present application. Neither Qi nor Schwarz disclose parallelogram shaped MTJs with two angles greater than approximately 90° and two angles less than approximately 90°. Amended Claims 11 and 14 further define that two longer opposing sides of the parallelogram shaped MTJs are parallel to the digit lines. Because neither Qi nor Schwarz disclose parallelogram shaped MTJs they cannot disclose a parallel arrangement between sides of parallelogram shaped MTJs and digit lines. Accordingly, Claims 10, 11, 13, and 14 are submitted to provide further basis for patentability over Qi in view of Schwarz.

New Claims 29-32 are Patentable Over Qi in view of Schwarz

New Claim 29 recites that the plurality of MTJs coupled by the bits lines and digit lines are arranged in a rectangular shape. For example, as shown above with reference to FIG. 9A of the present application and by the adjacent illustration, the MTJs are arranged in a rectangular shape. However, in Schwarz the digit lines 34 extend along a same direction to

intersect bit lines 33, instead of zigzagging, and consequently cause the MTJs to be arranged in a parallelogram shape, as shown below:

Parallelogram shape of array of MTJs of Schwarz



Accordingly, Claim 29 is submitted to provide further basis for patentability over Qi in view of Schwarz.

Claim 31 recites that the digit lines and/or the bit lines have a repeating "W" shape. Neither Qi nor Schwarz disclose either digit lines or bit lines that have a repeating "W" shape. Accordingly, Claim 31 is submitted to provide further basis for patentability over Qi in view of Schwarz.

Claim 32 recites that the digit lines and/or the bit lines have a repeating "V" shape. Neither Qi nor Schwarz disclose either digit lines or bit lines that have a repeating "V" shape. Accordingly, Claim 32 is submitted to provide further basis for patentability over Qi in view of Schwarz.

CONCLUSION

Applicants submit that the pending claims are patentable in light of the above remarks. Favorable reconsideration of this application is respectfully requested. If, in the

opinion of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (919) 854-1400.

Respectfully submitted,

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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on September 29, 2005.

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